PB82-194937

Environmental Protection Agency (EPA) Evaluation of the Super-Mag Fuel Extender under Section 511 of the Motor Vehicle Information and Cost Savings Act

(U.S.) Environmental Protection Agency
Ann Arbor, MI

Jan 82

U.S. Department of Commerce
National Technical Information Service
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16. ABSTRACT

This document announces the conclusions of the EPA evalution of the "Super-Mag Fuel Extender" device under provisions of Section 511 of the Motor Vehicle Information and Cost Savings Act.

On December 10, 1980, the EPA received a written request from the Metropolitan Denver District Attorney's Office of Consumer Fraud and Economic Crime to test at least on "cow magnet" type of fuel economy device. Following a survey of devices being marketed, the Metropolitan Denver District Attorney's Office selected the "Super-Mag" device as typical of its category and on April 13, 1981 provided EPA with units for testing.

The EPA evaluation of the device using three vehicles showed neither fuel economy nor exhaust emissions were affected by the installation of the "Super-Mag" device. In addition, any differences between baseline test results and results from tests with the device installed were within the range of normal test variability.

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EPA-AA-TEB-511-82-3

EPA Evaluation of the Super-Mag Fuel Extender Under Section 511 of the Motor Vehicle Information and Cost Savings Act

by

H. Anthony Ashby

January 1982

Test and Evaluation Branch
Emission Control Technology Division
Office of Mobile Source Air Pollution Control
Environmental Protection Agency

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ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 610]

[FRL _____]

FUEL ECONOMY RETROFIT DEVICES

Announcement of Fuel Economy Retrofit Device Evaluation for "Super-Mag Fuel Extender"

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of Fuel Economy Retrofit Device Evaluation.

SUMMARY: This document announces the conclusions of the EPA evaluation of the "Super-Mag Fuel Extender" device under provisions of Section 511 of the Motor Vehicle Information and Cost Savings Act.

BACKGROUND INFORMATION: Section 511(b)(1) and Section 511(c) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2011(b)) requires that:

(b)(1) "Upon application of any manufacturer of a retrofit device (or prototype thereof), upon the request of the Federal Trade Commission pursuant to subsection (a), or upon his own motion, the EPA Administrator shall evaluate, in accordance with rules prescribed under subsection (d), any retrofit device to determine whether the retrofit device increases fuel economy and to determine whether the representations (if any) made with respect to such retrofit devices are accurate."

(c) "The EPA Administrator shall publish in the Federal Register a summary of the results of all tests conducted under this section, together with the EPA Administrator's conclusions as to -

(1) the effect of any retrofit device on fuel economy;

(2) the effect of any such device on emissions of air pollutants; and

(3) any other information which the Administrator determines to be relevant in evaluating such device."

EPA published final regulations establishing procedures for conducting fuel economy retrofit device evaluations on March 23, 1979 [44 FR 17946].

ORIGIN OF REQUEST FOR EVALUATION: On December 10, 1980, the EPA received a written request from the Metropolitan Denver District Attorney's Office of Consumer Fraud and Economic Crime to test at least one "cow magnet" type of fuel economy device. Following a survey of devices being marketed, the Metropolitan Denver District Attorney's Office selected the "Super-Mag" device as typical of its category and on April 13, 1981 provided EPA with units for testing.

AVAILABILITY OF EVALUATION REPORT: An evaluation has been made and the results are described completely in a report entitled: "Evaluation of the Super-Mag Fuel Extender Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act", report number EPA-AA-TEB-511-82-3 consisting of 20 pages including all attachments.

EPA also tested the Super-Mag Fuel Extender device. The EPA testing is described completely in the report "Evaluation of the Super-Mag Fuel Extender", EPA-AA-TEB-81-30, consisting of 12 pages. This report is contained in the preceding 511 Evaluation as an attachment.

Copies of these reports may be obtained from the National Technical Information Service by using the above report numbers. Address requests to:

National Technical Information Service

U.S. Department of Commerce

Springfield, VA 22161

Telephone: (703) 487-4650 or FTS 737-4650

Summary of Evaluation

The "Super-Mag Fuel Extender" consists of a set of two rectangular magnets mounted on plates, two steel plates, and two plastic ties that are installed around a vehicle's fuel line, about 3 inches from the carburetor. The magnets and plates are arranged so as to form an open-ended four-sided box surrounding the fuel line. A claim for the device's effectiveness appears in a message on the package label, which reads "Transforms Molecular Properties of Liquid Fuel to Maximum Combustion Efficiency." Advertisements also state, "The Super-Mag has been developed to increase gas mileage on compact, mid-size and luxury model automobiles with a savings up to 30%."

The request for evaluation of the "Super-Mag Fuel Extender" was made by the Metropolitan Denver District Attorney's Office of Consumer Fraud and Economic Crime.

The EPA evaluation of the device using three vehicles, showed that there was no emission or fuel economy benefit due to the installation of the "Super-Mag Fuel Extender."

FOR FURTHER INFORMATION CONTACT: Merrill W. Korth, Emission Control Technology Division, Office of Mobile Source Air Pollution Control, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, (313) 668-4299.

Date

Kathleen Bennett
Assistant Administrator
for Air, Noise, and Radiation

EPA Evaluation of the Super-Mag Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act

The following is a summary of the information on the device available from the package label, the installation instructions, advertisements, and the EPA evaluation.

1. Marketing Identification of the Device:

"Super-Mag Fuel Extender"

2. Inventor of the Device and Patents:

A. Inventor

Not Known

B. Patent

There is no information on either packaging or installation instructions regarding patents. Advertisements indicate that a patent is pending.

3. Manufacturer of the Device:

Valor Enterprises, Inc.
185 West Hamilton Street
West Milton, OH 45383

4. Manufacturing Organization Principals:

Not Known

5. Marketing Organization in U.S. making Application:

Not Applicable

6. Applying Organization Principals:

Not Applicable

7. Description of Device:

A. Purpose of the Device:

It is stated on the package, "Transforms Molecular Properties of Liquid Fuel to Maximum Combustion Efficiency."

B. Theory of Operation:

Advertisements state, "The Super-Mag consists of several magnetic parts which create a field in your car's fuel line. This atomized state in the fuel substance gives the gasoline used in combustion type engines greater value in both spread and mixing with the air in the tank to produce energy savings". See Attachment C.

C. Detailed Description of Construction and Operation:

From Installation Instruction: "Each Super-Mag Kit contains: Two (2) magnet assemblies. Two (2) metal plates. Two (2) plastic ties."

No description of the device's operation is given in installation instructions or package label except for the message quoted in 7(A) and (B) above.

8. Applicability of the Device (stated in installation instructions):

"The Model SM101 Super-Mag Fuel Extender will work on any Combustion Engine: Lawn Mowers - Snow Mobiles - Boats - Rototillers - Motorcycles - Garden Tractors - Vans - Pickups - Trucks, etc."

9. Device Installation - (Installation Instructions included with device):

See Attachment B

10. Device Operation (as supplied by Applicant):

No information on the device's operation can be found on either the installation instructions or the package. Some discussion of the device's operation is contained in the advertisement, Attachment C.

11. Device Maintenance (as supplied by Applicant):

No maintenance requirements are stated on either installation instructions or the package.

12. Effects on Vehicle Emissions (non-regulated) (as supplied by Applicant):

Not Applicable

13. Effects on Vehicle Safety (as supplied by Applicant):

Not Applicable

14. Test Results (Regulated Emissions and Fuel Economy) (submitted by Applicant):

Not Applicable

15. Analysis

A. Description of Device:

The device consists of two rectangular magnets mounted on plates, two plates, and two plastic ties. The magnets and plates are installed on the fuel line about 3 inches from the carburetor so as to form an open-ended box enclosing the fuel line, with the magnets on opposite sides and attracting each other. The plastic ties pass through holes in the ends of the magnet assemblies to secure the "box" in place.

B. Applicability of Device:

The applicability of the device, as stated in Section 8 is considered to be valid.

C. Device Installation - Tools and Expertise Required:

The installation instructions furnished with the device are shown in Attachment B.

1. The instructions are considered to be adequate for the installation of the device.

2. The claim is made that the device will work on any engine (see Section 8). However, proper installation will depend on whether there is adequate room, which may be a problem in some of the applications listed (e.g. lawn mowers and other small engines).

3. No tools are required for installation, except those that might be used to replace a rubber fuel line with a steel or copper one.

4. No vehicle adjustments are associated with the installation of the device.

D. Device Operation:

The device has no operation as such. It is simply installed on the fuel line.

E. Device Maintenance:

No maintenance is mentioned in the installation instructions furnished with the device, nor does any maintenance appear to be necessary. If a fuel line is replaced then the new line and fittings should be periodically inspected.

F. Effects on Vehicle Emissions (non-regulated):

The device is considered to have no effect on non-regulated emissions.

G. Effects on Vehicle Safety:

The device is installed on the outside of the fuel line, so it should have no effect on vehicle safety. However, installation instructions state, "If your fuel line has a rubber hose, it must be removed and a steel or copper line added." A modified fuel line might have less integrity than the original, with the resulting chance of fuel leakage and increased fire hazard.

H. Test Results Supplied by Applicant:

Not Applicable

I. EPA Evaluation:

The EPA evaluation of the "Super-Mag Fuel Extender is described in report number EPA-AA-TEB-81-30 (Attachment A).

The summary of Results of that report is quoted here:

"Neither fuel economy nor exhaust emissions were affected by the installation of the Super-Mag device on the cars used in this evaluation.

"Any differences between baseline test results and results from tests with the device installed were within the range of normal test variability."

16. Conclusions

The Super-Mag Fuel Extender has no effect on either exhaust emissions or fuel economy.

List of Attachments

Attachment A	EPA Technical Report # EPA-AA-TEB-81-30, "Evaluation of the Super-Mag Fuel Extender"
Attachment B	Installation Instructions
Attachment C	Advertisement

Evaluation of the Super-Mag Fuel Extender

By

H. Anthony Ashby

August 1981

Test and Evaluation Branch
Emission Control Technology Division
Office of Mobile Source Air Pollution Control
Office of Air, Noise, and Radiation
U.S. Environmental Protection Agency

Background

The Environmental Protection Agency receives information about many systems which appear to offer potential for emission reduction or fuel economy improvement compared to conventional engines and vehicles. EPA's Emission Control Technology Division is interested in evaluating all such systems, because of the obvious potential benefits to the nation from the identification of systems that can reduce emissions, improve fuel economy, or both. EPA invites developers of such systems to provide complete technical data on the system's principle of operation, together with available test data on the system. In those cases for which review by EPA technical staff suggests that the available data show promise, or EPA is requested to test the device by other governmental agencies, attempts are made to schedule confirmatory tests at the EPA Motor Vehicle Emission Laboratory (MVEL) at Ann Arbor, Michigan. The results of all such test projects are set forth in a series of Test and Evaluation Branch reports, of which this report is one.

In the case of the Super-Mag device, the request for EPA evaluation was made by the Consumer Office of the Metropolitan District Attorney for Denver, Colorado. The testing load at MVEL was such that several months would elapse before the device could be tested there. EPA management therefore decided to conduct the evaluation at the facility of an EPA test contractor, Hamilton Test Systems, in Portland, Oregon. The tests were directed, and the device installed per manufacturer's instructions, by the on-site EPA Project Officer.

The Super-Mag is a retrofit device marketed by Valor Enterprises, Inc. of West Milton, Ohio. It consists of a set of magnets and sheet metal plates that are installed around an automobile's fuel line near the carburetor in a box-like arrangement. Valor Enterprises makes no claim in the installation instructions nor in its packaging for increased fuel economy or reduced emissions. On the package label, this statement appears: "Transforms Molecular Properties of Liquid Fuel to Maximum Combustion Efficiency."

The conclusions from EPA device evaluations can be considered to be quantatively valid only for the specific test vehicles used; however, it is reasonable to extrapolate the results from the EPA evaluation of other vehicles in a directional manner, that is, to suggest that similar results are likely to be achieved on other vehicles.

Summary of Results

Neither fuel economy nor exhaust emissions were affected by the installation of the Super-Mag device on the cars used in this evaluation.

Any differences between baseline test results and results from tests with the device installed were within the range of normal test variability.

Device Description

The Super-Mag Fuel Extender consists of two magnet assemblies, two steel plates, and two plastic ties. Each magnet assembly consists of a rectangular magnet with dimensions of 1.87" X 0.87" X 0.38" bonded to a steel plate 2.67" X 1.14" X 0.04. The two magnet assemblies are placed on opposite sides of the fuel line with the magnets on the inside, about 3 inches from the carburetor. The two steel plates are placed at the edges of the magnet assemblies and at right angles to them to form a sort of 4-sided box, enclosing the fuel line. (See illustrations in Appendix 1, which is a copy of the installation instructions that came with the device.)

Test Vehicles

Three test vehicles were chosen for this evaluation. The intent was to test a fairly wide range of model years, vehicle sizes, and engine sizes, and to have each major American manufacturer's products represented. The following vehicles were chosen:

1976 Chevrolet Malibu equipped with 350 CID V-8 engine and automatic transmission. Exhaust emission controls include exhaust gas recirculation (EGR) and oxidation catalyst. At the beginning of the evaluation, there were 75,810 miles on the car's odometer.

1978 Plymouth Horizon equipped with 105 CID in-line 4-cylinder engine and automatic transmission. Exhaust emission controls include EGR, air pump, and oxidation catalyst. There were 34,210 miles on the car's odometer at the beginning of the evaluation.

1981 Ford Fairmont equipped with 200 CID in-line 6-cylinder engine and automatic transmission. Exhaust emission controls include EGR, air pump, three-way catalyst, and oxidation catalyst. At the start of the evaluation there were 8,830 miles on the car's odometer.

Test Vehicle Descriptions may be found in Appendices 2 through 4.

Test Procedures

Exhaust emission tests were conducted according to the Federal Test Procedure (FTP) described in the Federal Register of June 28, 1977, and the EPA Highway Fuel Economy Test (HFET) described in the Federal Register of September 10, 1976. The vehicles were not tested for evaporative emissions.

Prior to baseline testing, each vehicle was given a specification check and diagnostic inspection. The ignition timing, idle speed, and fast idle speed were checked for agreement with the manufacturer's specifications given on the Vehicle Emission Control Information label affixed to the engine compartment. The vehicles were also inspected for engine vacuum leaks, proper connection of vacuum hoses, functioning PCV valve, oil and coolant levels, and general condition of engine compartment.

Repairs on each vehicle were as follows:

76 Malibu - Steam-cleaned engine, changed engine oil and filter, changed air filter. Replaced spark plugs. Replaced air cleaner hot air duct. Rebuilt carburetor (installed new needle valve, seat, power valve, gaskets, and fuel filter). Adjusted idle air-fuel ratio.

78 Horizon - Changed engine oil and oil filter, changed air filter. Replaced spark plugs. Replaced carburetor, checked choke operation, idle speed, ignition timing, idle air-fuel ratio.

81 Fairmont - No repairs or adjustments were necessary.

After repairs, the Malibu and the Horizon were driven on a 100-mile urban/suburban route in the Portland area to condition the engines and stabilize emissions, and then tested on the FTP and HFET. This sequence was repeated on the Malibu to ensure that the emission levels had stabilized. Because the Fairmont has just been used in a sequence of several consecutive FTP's, HFET's, and other dynamometer tests, it was felt that the road route driving was not necessary to stabilize its emissions.

At least two tests were conducted on each car in each of these configurations: baseline, with device installed, and final baseline. After the last emission test an engine diagnostic check was conducted to assure that the engine state of tune was still at manufacturer's specifications.

Results and Discussion

Composite FTP mass emissions and fuel economy, and HFET fuel economy, are listed in Table 1 for the 76 Malibu. Data for all seven tests plus averages are shown. The differences in emissions and fuel economy between the baseline tests and test with the Super-Mag installed are all within normal test variability, with the possible exception of NOx emissions. The NOx emissions averaged 1.97 gm/mi in baseline tests, and 2.14 gm/mi with the device installed, an increase of 8.6%. That difference is greater than two times the standard deviation on the baseline results. Normal variations in the operation of the EGR or ignition timing systems on this five-year-old car may be responsible for the difference.

Test results on the 78 Horizon are listed in Table 2. The differences in fuel economy and HC emissions between baseline tests and tests with the device installed are within normal tesitng variability.

CO and NOx emissions differences between baseline and with-device tests are somewhat larger. CO emissions averaged 15.9 gm/mi on four baseline tests and 14.1 gm/mi on two tests with the device. This is a reduction of 11.3% from baseline. This may appear to be a significant reduction, but the coefficient of variation of baseline CO is 11.9%. Thus, the CO difference is within normal test variability for this car.

Average NOx emissions increased from 1.70 gm/mi at baseline to 1.88 gm/mi with the device. The difference is about 1.5 standard deviations of the baseline results and is considered to be within normal test variability for this car.

On the 81 Fairmont, essentially two evaluations of the Super-Mag were required because of a step-change in CO emissions during testing. (Fuel economy was unaffected.) As shown in Table 3, baseline CO emissions averaged about 2.7 gm/mi. CO emissions with the device averaged about 3.3 gm/mi, within the range of test variability at such low levels of emissions. However, the post-device baseline tests gave CO emissions of about 6.1 gm/mi. A thorough engine diagnosis and fuel system examination revealed no deviation from manufacturer's specifications. An additional set of two tests confirmed the new baseline CO level of over 6 gm/mi.

Those four tests were used as the baseline for another evaluation of the device. The results from these four baseline tests, two tests with device installed, and two more baseline tests after removing the device are listed in Table 3 under the heading "2nd Evaluation". Any differences in results between baseline tests and those with the Super-Mag are well within normal test variability.

Conclusions

In tests on three cars representing a range of model years, engine sizes, and chassis layouts, the Super-Mag Fuel Extender had no significant effect on the emissions of any pollutant nor on fuel economy.

Table 1

Mass Emissions and Fuel Economy
76 Malibu

	FTP Emissions, gpm				Fuel Economy, mpg	
	HC	CO	CO_2	NOx	FTP	HFET
Baseline	1.24	24.12	658.0	2.01	12.7	18.0
	1.26	27.06	643.3	1.86	12.9	18.3
	1.34	28.22	632.4	1.95	13.0	18.4
with Device	1.36	30.18	662.9	2.16	12.4	17.6
	1.27	26.91	663.6	2.12	12.5	17.8
Post-Device Baseline	1.31	28.69	653.2	2.04	12.6	18.1
	1.39	30.95	655.7	1.97	12.5	18.0
Average of 5 Baseline Tests	1.31	27.81	648.5	1.97	12.7	18.2
Average 2 Tests With Device	1.32	28.55	663.3	2.14	12.5	17.7
% Change From Baseline	+.8%	+2.7%	+2.3%	+8.6%	-2%	-2.8%

Table 2

Mass Emissions and Fuel Economy
78 Horizon

	FTP Emissions, gpm				Fuel Economy, mpg	
	HC	CO	CO_2	NOx	FTP	HFET
Baseline	.75	16.6	332.1	1.73	24.6	34.6
	.80	16.9	322.6	1.78	25.2	34.4
with Device	.69	14.9	328.0	1.63	25.1	34.2
	.70	13.3	325.0	2.17	25.5	34.1
Post-Device	.64	13.1	331.9	1.78	25.0	33.8
Baseline	.81	17.1	320.8	1.50	25.3	34.4
Average of 4 Baseline Tests	.75	15.9	326.9	1.70	25.0	34.3
Average 2 Tests With Device	.70	14.1	326.5	1.88	25.3	34.2
% Change From Baseline	-6.7%	-11.3%	-0.1%	+10.6%	+1.2%	-.3%

Table 3

Mass Emissions and Fuel Economy
81 Fairmont

	FTP Emissions, gpm				Fuel Economy, mpg	
	HC	CO	CO_2	NOx	FTP	HFET
Baseline	.30	2.57	513.5	.87	17.1	23.3
	.28	2.72	513.3	.80	17.1	23.1
Average of 2 Baseline	.29	2.65	513.4	.84	17.1	23.2
with Device	.30	3.20	510.3	.73	17.2	23.4
	.34	3.34	511.8	.72	17.1	23.0
Average 2 Tests With Device	.32	3.27	511.1	.73	17.2	23.2
% Change	+10.3%	+19%	-.5%	-13%	+.6%	0
			2nd Evaluation			
Baseline	.52	6.12	499.7	.80	17.4	23.5
	.54	6.15	508.4	.73	17.1	23.2
	.60	6.91	517.3	.77	16.7	23.2
	.56	6.47	508.8	.61	17.0	22.7
With	.54	6.26	514.4	.80	16.9	22.5
Device	.56	6.79	508.2	.75	17.0	22.9
Post-Device	.54	6.58	507.0	.94	17.1	22.0
Baseline	.56	6.91	509.3	.71	17.0	22.6
Average of 6 Baselines	.55	6.52	508.4	.76	17.1	22.9
Average 2 Tests With Device	.55	6.53	511.3	.78	17.0	22.7
% Change from baseline	0	+.2%	+.6%	+2.6%	-.6%	-.9%

SUPER-MAG FUEL EXTENDER

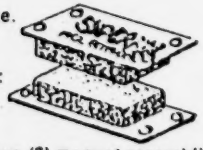
MODEL SM101

"By VALOR — the Innovators in Energy Saving Devices"

INSTALLATION INSTRUCTIONS

Congratulations! You have just purchased the Super-Mag Fuel Extender — a break through in a Fuel Saving Device.

1. Remove all parts from package.
2. Each Super-Mag Kit contains:

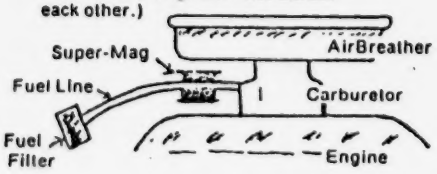


Two (2) magnet assemblies.

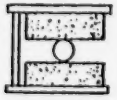
Two (2) metal plates.

Two (2) plastic ties.

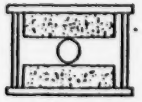
3. Remove air breather.
4. Check to see where fuel line enters carburetor. (Line will come from fuel pump to carburetor.) If your fuel line has a rubber hose, it must be removed and a steel or copper line added.
5. Install the Super-Mag Fuel Extender approximately 3" from the carburetor. Position between the carburetor and fuel filter on fuel line. (For proper installation, magnets must attract each other.)



6. Where room is available, Extender can be installed using the Three Plates or Box Method.



7. Preferred installation is to use the Four-Plate or Box Method. Using the Plate Method will amplify the magnetic field.



8. Secure Super-Mag Fuel Extender with plastic ties placed through holes in each end of plate. (See illustration.)

9. Completely tape the Super-Mag Fuel Extender for a cleaner installation.
10. If carburetor has a built-in filter or screen, it must be removed. Then install Super-Mag as in Step 5.

NOTE:
Always install Super-Mag Fuel Extender with magnetic force attracting each other.

TEST PROCEDURE

To start (Before installation of Super-Mag Fuel Extender)

- Note temperature, barometic pressure and humidity.
- Note the beginning and end time of test, and the miles traveled. This will enable you to calculate your average speed.
- Top-off tank (Shake car to eliminate air pockets in tanks.)
- Drive car 80 to 100 miles.
- Refill tank (Top-off)
- Divide miles by gallons of fuel — this will give you the miles per gallon.

Install Super-Mag Fuel Extender as per instructions on reverse side.

Re-test car duplicating conditions as in Section 1 as closely as possible.

These Factors Will Affect Fuel Mileage.
Air Temperature • Head Winds • Road Conditions • Condition of Engine • Tire Pressure • Hill Terrain • Driving Technique

PRODUCT LIMITED WARRANTY

Valor Enterprises, Incorporated warrants all products for thirty days from date of original purchase against manufacturing defects in material and workmanship in accordance with the following terms and conditions. This warranty applies to the original purchaser only and is not transferable.

1. During warranty period, Valor Enterprises will repair without charge valid defects in materials and workmanship. Warranty does not apply to units that have been damaged through accident, misuse, negligence, modification, abuse, normal expected wear, installation, and weather or act of God. Damage that is determined to be this nature will be repaired at consumer's expense. Warranty does not apply to labor and repair expenses not performed by Valor Service Department, such as repair, removal, and installation. Missing accessories will be replaced at a charge to the sender. Not in warranty if not properly installed, resulting in any damage to the vehicle.

2. The extent of repairs or adjustments covered under this warranty are to be determined by Valor Enterprises. Valor Enterprises reserves the right to make final judgement as to causes of defects.

3. For you protection, we require proof of original purchase date for warranty determination-sales invoice or cancelled check is satisfactory evidence. This procedure insures that you receive full-term warranty from the date of original purchase so that the time the unit remains in dealer stock is not deducted.

4. All packaging and shipping charges to return units for repair are the responsibility of the customer. Pack units carefully to eliminate shipping damages. It is wise to insure shipments against loss or damage. Return units to Valor Enterprises, Incorporated, 185 West Hamilton Street, West Milton, 45383. Attention: Warranty Repair Department. Please include a detailed description of the problem along with proof of purchase. If the unit is under warranty, Valor Enterprises will return it prepaid. Inquiries concerning the status of a warranty claim may be directed to the above address, or by telephoning (513) 698-4194 and asking for Customer Service.

5. UNDER NO CIRCUMSTANCES SHALL VALOR ENTERPRISES, INCORPORATED BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES FOR BREACH OF THIS WARRANTY OR OF ANY IMPLIED WARRANTY.

6. Consumer may appeal product repair charges by stating the complaint in writing to Valor Enterprises. Remedial action requests will be answered within three weeks after receipt. Consumers are required to seek remedial action to Valor Enterprises before resorting to a third party.

7. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

The Model SM101 Super-Mag Fuel Extender will work on any Combustion Engine: Lawn Mowers — Snow Mobiles — Boats — Rototillers — Motorcycles — Garden Tractors — Vans — Pickups — Trucks, etc.

Special Note.
Please write to us at Valor Enterprises, Inc. and tell us the results of your use of the Super-Mag Fuel Extender. Your letter may be used in our National Advertising Program.

VALOR ENTERPRISES, INC.
185 West Hamilton Street
West Milton, Ohio 45383

Appendix 2

TEST VEHICLE DESCRIPTION

Chassis model year/make: 1976 Chevrolet Malibu
Vehicle ID No.: 1029V6Z473383

Engine

type	spark ignition V-8
bore x stroke	4.00 in. x 3.48 in.
displacement	350 CID/5.7 liter
compression ratio	8.5:1
maximum power @ rpm	145 hp @ 3800 rpm
fuel metering	2-venturi carburetor
fuel requirement	Unleaded gasoline. Tested on Indolene HO.

Drive Train

transmission type	3 speed automatic
final drive ratio	2.56

Chassis

type	4-door sedan
tire size	not recorded
curb weight	not measured
inertia weight	4500 lb
passenger capacity	6

Emission Control System

basic type	EGR oxidation catalyst

Appendix 3

TEST VEHICLE DESCRIPTION

Chassis model year/make: 1978 Plymouth Horizon
Vehicle ID No.: ML 44A8D235515

Engine

type	spark ignition in-line 4
bore x stroke	3.13 in x 3.4 in.
displacement	105 CID/1.7 liter
compression ratio	8.2:1
maximum power @ rpm	75 hp @ 5600 rpm
fuel metering	2 venturi carburetor
fuel requirement	Unleaded gasoline. Tested on Indolene HO.

Drive Train

transmission type	3 speed automatic
final drive ratio	3.48

Chassis

type	4-door sedan
tire size	P165/75R13
curb weight	not measured
inertia weight	2500 lb, 7.0 ahp at 50 mph
passenger capacity	5

Emission Control System

basic type	EGR Air pump Oxidation catalyst

Appendix 4

TEST VEHICLE DESCRIPTION

Chassis model year/make: 1981 Ford Fairmont
Vehicle ID No.: 1FABP21B3BK112840

Engine

type	spark ignition in-line 6
bore x stroke	3.68 in. x 3.13 in.
displacement	200 CID/3.3 liter
compression ratio	8.6:1
maximum power @ rpm	94 hp
fuel metering	1-venturi carburetor
fuel requirement	Unleaded gasoline. Tested on Indolene HO.

Drive Train

transmission type	3-speed carburetor
final drive ratio	2.73

Chassis

type	4-door sedan
tire size	P175/75R14
curb weight	not measured
inertia weight	3000 lb, 10.7 ahp at 50 mph
passenger capacity	6

Emission Control System

basic type	EGR Air pump Three-way catalyst (open loop) Oxidation catalyst

SUPER-MAG FUEL EXTENDER

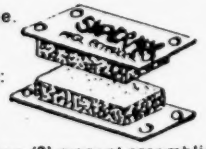
MODEL SM101

"By VALOR — the Innovators in Energy Saving Devices"

INSTALLATION INSTRUCTIONS

Congratulations! You have just purchased the Super-Mag Fuel Extender — a break through in a Fuel Saving Device.

1. Remove all parts from package.
2. Each Super-Mag Kit contains:

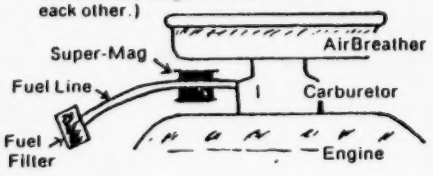


Two (2) magnet assemblies.

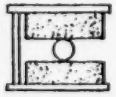
Two (2) metal plates.

Two (2) plastic ties.

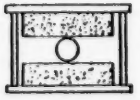
3. Remove air breather.
4. Check to see where fuel line enters carburetor. (Line will come from fuel pump to carburetor.) If your fuel line has a rubber hose, it must be removed and a steel or copper line added.
5. Install the Super-Mag Fuel Extender approximately 3" from the carburetor. Position between the carburetor and fuel filter on fuel line. (For proper installation, magnets must attract each other.)



6. Where room is available, Extender can be installed using the Three Plates or Box Method.



7. Preferred installation is to use the Four-Plate or Box Method. Using the Plate Method will amplify the magnetic field.



8. Secure Super-Mag Fuel Extender with plastic ties placed through holes in each end of plate. (See illustration.)

9. Completely tape the Super-Mag Fuel Extender for a cleaner installation.
10. If carburetor has a built-in filter or screen, it must be removed. Then install Super-Mag as in Step 5.

NOTE:
Always install Super-Mag Fuel Extender with magnetic force attracting each other.

TEST PROCEDURE

To start (Before installation of Super-Mag Fuel Extender)

- Note temperature barometic pressure and humidity.
- Note the beginning and end time of test, and the miles traveled. This will enable you to calculate your average speed.
- Top-off tank (Shake car to eliminate air pockets in tanks.)
- Drive car 80 to 100 miles.
- Refill tank (Top-off)
- Divide miles by gallons of fuel — this will give you the miles per gallon.

Install Super-Mag Fuel Extender as per instructions on reverse side.

Re-test car duplicating conditions as in Section 1 as closely as possible.

These Factors Will Affect Fuel Mileage.
Air Temperature • Head Winds • Road Conditions • Condition of Engine • Tire Pressure • Hilly Terrain • Driving Technique

PRODUCT LIMITED WARRANTY

Valor Enterprises, Incorporated warrants all products for thirty days from date of original purchase again manufacturing defects in material and workmanship in accordance with the following terms and conditions. Th warranty applies to the original purchaser only and is not transferable.

1. During warranty period Valor Enterprises will repair without charge valid defects in materials and workma ship. Warranty does not apply to units that have been damaged through accident, misuse negligence, modi cation, abuse, normal expected wear, installation, and weather or act of God. Damage that is determined to be this nature will be repaired at consumer's expense. Warranty does not apply to labor and repair expenses not pe formed by Valor Service Department, such as repair, removal, and installation. Missing accessories will replaced at a charge to the sender. Not in warranty if not properly installed, resulting in any damage to the vehicl

2. The extent of repairs or adjustments covered under this warranty are to be determined by Valor Enterprise Valor Enterprises reserves the right to make final judgement as to causes of defects.

3. For you protection, we require proof of original purchase date for warranty determination-sales invoice cancelled check is satisfactory evidence. This procedure insures that you receive full-term warranty from the da of original purchase so that the time the unit remains in dealer stock is not deducted

4. All packaging and shipping charges to return units for repair are the responsibility of the customer. Pack uni carefully to eliminate shipping damages. It is wise to insure shipments against loss or damage. Return units Valor Enterprises, Incorporated, 185 West Hamilton Street, West Milton, 45383. Attention: Warranty Repa Department. Please include a detailed description of the problem along with proof of purchase. If the unit is und warranty, Valor Enterprises will return it prepaid. Inquiries concerning the status of a warranty claim may be d rected to the above address, or by telephoning (513) 698-4194 and asking for Customer Service.

5. UNDER NO CIRCUMSTANCES SHALL VALOR ENTERPRISES, INCORPORATED BE LIABLE FO ANY CONSEQUENTIAL DAMAGES FOR BREACH OF THIS WARRANTY OR OF ANY IMPLIED WARRANTY.

6. Consumer may appeal product repair charges by stating the complaint in writing to Valor Enterprises. Remedi action requests will be answered within three weeks after receipt. Consumers are required to seek remedial acti to Valor Enterprises before resorting to a third party.

7. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state

The Model SM101 Super-Mag Fuel Extender will work on any Combustion Engine: Lawn Mowers — Sno Mobiles — Boats — Rototillers — Motorcycles — Garden Tractors — Vans — Pickups — Trucks, etc.

Special Note.
Please write to us at Valor Enterprises, Inc. and tell us the results of your use of the Super-Mag Fuel Extender. Your letter may be used in our National Advertising Program.

VALOR ENTERPRISES, INC.
185 West Hamilton Street
West Milton, Ohio 45383

Big Fuel Savings

ON ALL CARS
BIG OR SMALL

With

SUPER-MAG™

Patent Pending

Fuel Extender

IT ALL ADDS UP TO BIG SAVINGS

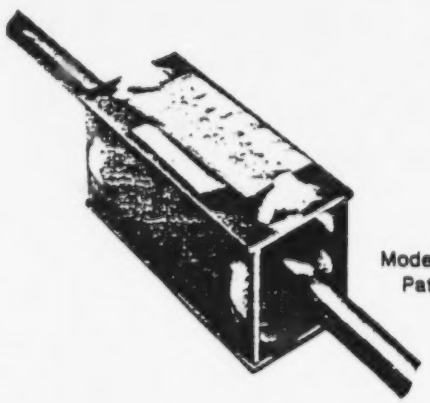
The high cost of gasoline. That's a problem that affects everyone. It's also a problem that can be solved with the Super-Mag Fuel Extender. The Super-Mag has been developed to increase gas mileage on compact, mid-size and luxury model automobiles with a savings of up to 30%. That savings adds up to more dollars in your pocketbook instead of your gas tank.

HELP BEAT INFLATION!

With the rising cost of gasoline, it makes sense not to pay a penny more than you have to. So economize. The Super-Mag gives you an alternative way to fight inflation. If you don't want to sacrifice comfort, or you don't want to increase your expenses by buying a new economy car, you can equip the car you now own with the Super-Mag Fuel Extender. The Super-Mag installs easily in a matter of minutes. Once it is installed, you will see results with your first tank of gasoline. Then, you can join the other Super-Mag owners across the United States who have already reported a savings of 10 to 30%!

PROVEN PERFORMANCE

The Super-Mag works on basically the same principle that was used to make the Alaskan Pipeline more efficient to operate. When the density of the crude oil flowing through the pipeline resulted in partial blockage, the pipeline was fitted with magnetized devices, similar to the Super-Mag. The crude oil molecules were atomized into a separated state thus eliminating the potential hazards and inefficiency associated with the build-up. The Super-Mag consists of several magnetic parts which create a field in your car's fuel line. This atomized state in the fuel substance gives the gasoline used in combustion type engines greater value in both spread and mixing with the air in the tank to produce energy savings. And, what's more, the Super-Mag doesn't affect your car's total performance except to save you money!



Model No. SM-101
Patent Pending

- Increased Mileage 10-30%
- Easy to Install
- Economical to Own
- 30-Day Full Guarantee
- Fits Most Vehicles

Alaskan Pipeline...

Used 40,000 5-pound magnets

The theory of molecular dispersion as a cost saving factor has been practiced successfully on large scale operations like the Alaskan Pipeline. On your automobile it will work with the same proven performance.

Super-Mag users report definite increase in mileage!

Thank you and congratulations on the "Super-Mag" fuel extender. I own a 1980 Lincoln Mark VI, my gas mileage on the open road before putting the "Super-Mag" on my car was 17 miles per gallon. After installing the "Super-Mag", I made a trip to Denver, Colorado, which is 550 miles from Billings, Montana, on this trip I averaged 24.5 miles per gallon going down and 25.5 on the return trip, this was driving at speeds of 55/60 MPH.

For such a small investment of $19.95, it has more than paid for itself in saving gasoline on this one trip.

I am so thoroughly pleased with the "Super-Mag", that I am recommending this fantastic fuel extender to all my friends. I wholeheartedly recommended every energy conservation minded person to purchase one for their vehicle.

Eileen Stumpf
Billings, Montana

When I purchased my new car, I was thrilled with it but I wasn't too happy about the mileage I got with it. When I was introduced to the Super-Mag fuel saver I was extremely skeptical about it, but I decided to try it. Up to that point I was getting about 11 to 12 miles a gallon on my car on expressway driving and about 8 miles a gallon for city driving. I had occasion to travel to near-by Arlington that particular evening which is about 55 miles from my home so I took a test drive. To my amazement, I got 19 miles per gallon. I couldn't believe it. Since that time, I have tested it many times, and find that I now get about 12 to 13 miles per gallon doing city driving.

I cannot praise the Super-Mag enough. With the high price of gasoline, it is really remarkable.

Dorothy M. DeMore
Garland, Texas

This is to advise you in regards to my experience with the application of the "Super-Mag" to the fuel system of one of my personal automobiles.

I installed the "Super-Mag" on a 1972 Model Plymouth Suburban Stationwagon with a 400 cubic inch V8 engine and two barrel carburetor. The "Super-Mag" was installed on the steel fuel line located just upstream of the point where the line connects to the carburetor. This car has been operated primarily in in-city type driving in heavy traffic with the air conditioner operating and has been driven approximately 50% of the time by my teenage son who, I am sure, makes no particular effort to obtain maximum fuel economy.

Since installing the "Super-Mag" on this car it is indicated that mileage has increased approximately 10 to 12½. Although we have not made any mileage tests in regard to highway type driving, I would expect the improvement in fuel economy to be even greater under such driving conditions.

Michael E. Martin
Richardson, Texas

I recently purchased a "Fuel Extender" for my 1978 Dodge truck. I have had problems with my gas mileage since purchase. Service on problems have been to no avail. I was getting 10.2 miles per gallon. Since I put on your "Fuel Extender", I am now getting 14.9 miles per gallon. That is an increase of 4.7 gallons. My engine is even running better. It is more quieter and smoother.

I would like to thank you for your great invention. I wish your company continued success.

Richard L. Burch
Piqua, Ohio

I put your Super-Mag on my '74 Maverick. All my driving on the first test was within the city limits. Before installation of the Super-Mag I was averaging 12.5 MPG. After installation I averaged 13.9 MPG. My carburetor has a built-in filter which I didn't fool with. I know your instructions say to put the filter behind the Super-Mag, and I'm going to do this as soon as I can. I think your product is great. There are four cars in my family, and all of them are going to get a Super-Mag.

Wayne Hall
Dallas, Texas

I own a 1978 Camaro LT V-8 with a 350 engine. I use my car to commute to work and to run errands—all in-city driving; few expressways and no highway at all. I normally gas up my car once a week.

Prior to installation of the Super-Mag Assembly, I was getting 11.87 mpg. After installation of the Super-Mag, I drove my car as normal. After six days when the fuel gauge registered low, I fueled up and calculated that I obtained 13.10 mpg. The second week I registered 13.31 mpg and the next week, I registered *14.73 mpg.* This represents a 24% increase in miles per gallon in three weeks.

It would seem that the longer the Super-Mag remains attached, the better miles per gallon I register because of the continual increase in mpg each week.

I'm quite excited about this device and look forward to my next fuel fill-up to see what new increase I get.

Janis Lee
Richardson, Texas

I own a small distributing company, and I am the only salesman for the company. I travel an average of 1,000 miles per week, these are hard highway miles.

I put the "Super-Mag" on my 1979 Chevrolet Van, and I don't mind telling you it's one of the best things I have ever done.

My mileage has increased from 9 miles per gallon to 13.5 miles per gallon. This means I'm saving dollars at the end of each route.

I am having less problems with vapor locking since installing the "Super-Mag"

Most everyone can afford the small investment of $19.95, as it more than pays for itself in a short period of time.

Jim Walker
Billings, Montana

Prior to installing the Super-Mag, I was getting 18 mpg on my 1979 Chrysler LaBaron. On an accurate test drive of over 300 miles, my mileage increased to 21.14 mpg.

I look forward to lots of dollars saved at today's high gas prices and will encourage my customers to save fuel and money too.

I think it's great!

Vel Newman
Weiser, ID

In my initial test of the Super-Mag Fuel Extender on my 1979 Chevrolet Caprice Classic wagon, the highway mileage increased from 14.2 to 18 miles per gallon.

In my business, driving 30,000 miles per year, I will save over $600.00 on my annual fuel bill.

Bob Proctor
Oregon City, OR

The Super-Mag Fuel Extender comes with a 30-Day Full Guarantee.

For More Information, Contact:

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West Milton, Ohio 45383
Ph: (513) 698-4194

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